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STRATEGY RESEARCH PROJECT

CALL FOR HELP!: THE U.S. ARMY CORPS OF ENGINEERS AS PART OF AN INTERAGENCY TEAM IN PROVIDING DISASTER RELIEF UNDER THE STAFFORD ACT

BY

COLONEL JEFFREY C. SMITH United States Army

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U.S. Army War College CARLISLE BARRACKS, PENNSYLVANIA 17013

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ABSTRACT

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Under the Robert T. Stafford Disaster Relief and Emergency Assistance Act (42 U.S.C. 5121) and as described in the Federal Response Plan, the U.S. Army Corps of Engineers (USACE) is the Executive Agent on behalf of the Department of Defense to accomplish Emergency Support Function #3 (ESF #3), Public Works and Engineering when the President declares a disaster. This effort occurs under the direction of the Federal Emergency Management Agency (FEMA). This SRP examines how USACE organizes at national and regional/local levels and how it plans, trains and prepares for the ESF #3 mission. It also examines USACE's success during the last nine years in interacting with FEMA and the Interagency to accomplish this function. The SRP evaluates USACE involvement in consequence management for both federally declared natural disasters and terrorist strikes. The SRP concentrates on Stafford Act disasters that occurred after 1992 because FEMA (and, hence, USACE) changed its approach after several poor performances prior to 1993. The SRP notes strengths and weaknesses in USACE's organization, planning, training and other preparations for the ESF #3 mission. It also concludes that USACE's successful approach to the ESF #3 mission can be replicated by government agencies at any level that are charged with other emergency support functions.

TABLE OF CONTENTS

ABSTRACT	
LIST OF ILLUSTRATIONS	VII
CALL FOR HELP!: THE U.S. ARMY CORPS OF ENGINEERS AS PART OF AN INTERAGE IN PROVIDING DISASTER RELIEF UNDER THE STAFFORD ACT	
DOCTRINE FOR EMERGENCY RESPONSE UNDER THE STAFFORD ACT	2
FEMA/USACE ORGANIZATION FOR EMERGENCY RESPONSE UNDER STA	
NATIONAL-LEVEL ORGANIZATION	
REGIONAL/LOCAL-LEVEL ORGANIZATION	6
PLANNING, TRAINING AND PREPARATION FOR THE ESF #3 MISSION	10
PLANNING	11
Readiness 2000	11
After Action Reviews	12
TRAINING	12
PREPARATION	13
Deployable Tactical Operations Systems	14
Advanced Contracting Initiative	15
ENGLink	16
AREAS FOR IMPROVEMENT	17
INTERAGENCY PREPARATION	17
NATIONAL - REGIONAL COMMAND AND CONTROL	18
COMMUNICATIONS	19
CONCLUSION	20
ENDNOTES	23
RIRI IOGRAPHY	29

vi

LIST OF ILLUSTRATIONS

FIGURE 1.	FEMA EMERGENCY SUPPORT FUNCTIONS	2
FIGURE 2.	FEMA/USACE ORGANIZATION FOR STAFFORD ACT RESPONSE	5
FIGURE 3.	FEMA REGIONS	6
FIGURE 4.	USACE DIVISIONS & DISTRICTS	7
FIGURE 5.	TYPICAL ERRO ORGANIZATION	9
FIGURE 6.	TYPICAL DTOS LAYOUT	.15

CALL FOR HELP!: THE U.S. ARMY CORPS OF ENGINEERS AS PART OF AN INTERAGENCY TEAM IN PROVIDING DISASTER RELIEF UNDER THE STAFFORD ACT

Prior to 1993, the Federal Government's performance when helping states recover from disasters was widely considered inept. Major disasters, such as Hurricane Hugo and the Loma Prieta earthquake in 1989 generated intense criticism of the Federal response effort. When Hurricane Andrew leveled South Florida and Hurricane Iniki destroyed much of the Hawaiian island of Kauai in 1992, the Federal Emergency Management Agency's (FEMA) sluggish response while managing Federal disaster relief efforts led to a scathing report from the General Accounting Office (GAO). Although not specifically cited in the report, the United States Army Corps of Engineers (USACE) had also been involved in each incident so, by extension, its ability to effectively perform engineering support functions in a FEMA-managed disaster area was called into question. Now, fast forward to 2002. The response of FEMA and USACE to recent emergencies indicates that both organizations have made great progress in the ten years that have elapsed since those flawed performances. In March 2001, the GAO released an exceptionally positive report on FEMA's ability to conduct consequence management.² Then in October 2001, after witnessing the federal response to September 11th's terrorist attacks, Governor Tom Ridge gave the Corps of Engineers the ultimate complement. At his swearing-in as the new Director of Homeland Security, Governor Ridge said his office would emulate USACE by following one of its adopted mottoes: "The difficult, we do immediately. The impossible takes a little longer."³

This report will describe how USACE has organized, planned, trained and prepared to conduct its engineering responsibilities in support of FEMA during federally declared disasters since 1993. It will demonstrate that USACE's mission preparation and execution, in conjunction with FEMA, is exemplary – something almost unheard of in interagency efforts. Although the report concentrates on only one of the twelve major disaster relief functions coordinated by FEMA, many of the lessons learned in this study of USACE can be applied to other government agencies that are involved in disaster response and recovery. Most of the lessons can apply to state and local agencies as well as federal agencies. The key to USACE's success is its deliberate, detailed approach to problem solving and willingness to apply resources (time, money and personnel) against its shortcomings. Beyond any technical discussions of the particular approaches that USACE takes to solve engineering challenges is the simple realization that problem identification, analysis and follow through are the keys to its success – and these concepts can apply to any organization.

This report concentrates on USACE's responsibility as the primary federal agency to execute Emergency Support Function 3 (ESF #3), Public Works and Engineering. The function is described in the <u>Federal Response Plan</u>, a FEMA publication that outlines how the Federal Government implements the Robert T. Stafford Disaster Relief and Emergency Assistance Act (P.L. 93-288, 23 November 1988). The Stafford Act establishes the basis for federal assistance to state and local governments when they cannot adequately respond to destructive natural events or terrorist incidents.⁴ USACE also performs public works and engineering responsibilities in some flood-impacted areas under a different Public Law, 84-99, "The Flood Control Act of 1941." This report will not cover P.L. 84-99 floods because, in those cases, USACE acts solely at the discretion of the Chief of Engineers with no FEMA involvement.⁵

DOCTRINE FOR EMERGENCY RESPONSE UNDER THE STAFFORD ACT

Historically poor performances by FEMA and other federal agencies in disaster relief since FEMA's creation in 1979 through 1993 led to a series of congressional hearings, critical GAO evaluations and negative press reports. In particular, the 1993 GAO report criticized FEMA's underutilization of military capabilities. In turn, this spurred both FEMA and the Department of Defense (DoD) to create a flurry of plans and directives that institutionalized military assistance, including contributions from USACE. The keystone document for Stafford Act response is FEMA's Federal Response Plan (April 1992, revised April 1999).

The <u>Federal Response Plan</u> identifies twelve Emergency Support Functions (ESFs) that may be required during Stafford Act emergencies. The Department of Defense is a designated

EMERGENCY SUPPORT FUNCTION	PRIMARY AGENCY
1. TRANSPORTATION	DEPARTMENT OF TRANSPORTATION
2. COMMUNICATIONS	NATIONAL COMMUNICATIONS SYSTEM
3. PUBLIC WORKS & ENGINEERING	DEPARTMENT OF DEFENSE
4. FIREFIGHTING	U.S. DEPARTMENT OF AGRICULTURE
5. INFORMATION & PLANNING	FEDERAL EMERGENCY MNGT AGENCY
6. MASS CARE	AMERICAN RED CROSS
7. RESOURCE SUPPORT	GENERAL SERVICES ADMINISTRATION
8. HEALTH & MEDICAL SERVICES	DEPT OF HEALTH & HUMAN SERVICES
9. URBAN SEARCH & RESCUE	FEDERAL EMERGENCY MNGT AGENCY
10. HAZARDOUS MATERIALS	ENVIRONMENTAL PROTECTION AGENCY
11. FOOD	U.S. DEPARTMENT OF AGRICULTURE
12. ENERGY	DEPARTMENT OF ENERGY

FIGURE 1. FEMA EMERGENCY SUPPORT FUNCTIONS⁶

support agency for eleven of them. DoD has "primary agency" responsibility for only one, ESF #3, Public Works and Engineering. The Secretary of Defense named the Secretary of the Army as DoD's Executive Agent to accomplish these support functions.⁷ In turn, the Secretary of the Army directed USACE to be his Operating Agent for ESF #3, "because of its unique qualifications...to provide public works and engineering support to the overall effort to assist the states in preservation of life and property."

USACE organizes for and prepares to provide the following types of assistance under ESF #3:

- Prepositioning assessment teams and contractors prior to an expected disaster.
- Performing damage assessments.
- Emergency clearing of debris for lifesaving, property protection, health and safety.
- Managing debris disposal on public property.
- Providing emergency access routes.
- Restoring critical public facilities, such as water supply and wastewater treatment.
- Emergency demolition or stabilization of structures that endanger the public.
- Emergency contracting for potable water, ice, power and temporary housing.
- Inspecting private structures.
- Providing emergency power to public facilities.9

Several DoD publications define and describe the authorizations and limitations under which USACE acts when providing Stafford Act support. All were written after creation of the Federal Response Plan. DoD Directive 3025.1, Military Support to Civil Authorities (MSCA) (January 1993), establishes the Directorate of Military Support (DOMS) as the single headquarters element under which the DoD Executive Agent issues orders in support of civil authorities. In an attempt to provide more timely support during emergencies, the directive authorizes military commanders to provide "immediate response" to civil authorities in the absence of higher headquarters approval in order to save lives, prevent human suffering or mitigate great property damage. DoD Manual 3025.1-M, Manual for Civil Emergencies (June 1994), implements the DoD Directive and provides, "guidance for the preparation, coordination and execution of military support to civil authorities within the United States." Finally, FM 100-19, Domestic Support Operations (July 1993), describes responsibilities of army forces, including USACE, across a wide range of support operations. This includes Stafford Act support. The body of publications described above has provided a solid foundation for military participation in support of FEMA during domestic emergencies. The organizations established

and procedures followed at Department of Defense level have proven effective in a wide variety of support missions to civil authorities. They remain largely unchanged as we enter the 21st Century.

USACE has also created a body of doctrine to establish internal policies and procedures in support of the Stafford Act. Among DoD elements, USACE had a head start in developing civil support doctrine because of its 60-year tradition of providing flood relief support in the United States. However, USACE had historically taken a regional approach to disaster relief. Each division and district determined its own approach with minimal direction provided by Headquarters, USACE. Recently, USACE developed a uniform national concept, designed to take maximum advantage of its nationwide resources. This concept, called Readiness 2000 (R2K), "organizes and manages resources through a national strategy, aligning the readiness community into a corporate Corps team that shares planning responsibilities and support capabilities." Although some aspects of preparation are centralized, each division and district office is still, "responsible for emergency preparedness and develops plans for responding to disasters. These plans are based on the hazards unique to their area of responsibility and the plans are coordinated with the states and other Federal agencies, as appropriate." In this way, the Readiness 2000 concept centralizes some aspects of organizing and preparing for emergencies to effectively use low density USACE capabilities, while allowing USACE divisions and districts to concentrate their plans on the types of disasters they will most likely experience in their regions. This doctrine's effect on organization, planning, training and preparation will be examined later in this report.

FEMA/USACE ORGANIZATION FOR EMERGENCY RESPONSE UNDER STAFFORD ACT

NATIONAL-LEVEL ORGANIZATION

As it organizes for its ESF #3 mission, USACE ensures that it has a parallel element for every structural level of FEMA. At the National level, USACE provides emergency representatives to three elements. The first is FEMA's Emergency Support Team (EST), an interagency group that provides general coordination support to response activities in the field. It operates from FEMA's Emergency Information and Coordination Center (EICC) in Washington, D.C. The Emergency Support Team coordinates and tracks deployment of resources and support items to disaster responders. It is also the Federal Government's central emergency response information clearinghouse and the first national point of contact for regional and local responders in order to resolve policy issues and resource support conflicts. USACE provides a cell headed by a representative from its Civil Emergency Management

Branch, Operations Division, Directorate of Civil Works to work as part of the Emergency Support Team.¹⁵

The second element is FEMA's most authoritative. The Catastrophic Disaster Response Group (CDRG) convenes during emergencies when required at FEMA Headquarters in Washington, D.C. USACE's representative to the Catastrophic Disaster Response Group is its senior emergency response official, the Chief of Operations Division, Directorate of Civil Works. The Catastrophic Disaster Response Group provides guidance and policy direction on response coordination and operational issues arising from regional activities. It also decides policy issues and resource support conflicts that can't be resolved at the local or regional levels or by the Emergency Support Team.¹⁶

Finally, USACE activates its own emergency operations center under the direction of a Crisis Management Team (CMT) at its headquarters in Washington, D.C. Called the USACE Operations Center (UOC), it establishes and maintains communications with FEMA, the Army Operations Center and USACE subordinate organizations. The USACE Operations Center provides liaison to FEMA Headquarters to coordinate congressional relations activities, as well as a public affairs liaison to the FEMA Joint Information Center. As response and recovery operations proceed, the USACE Operations Center coordinates support across its subordinate Divisions and laboratories.¹⁷

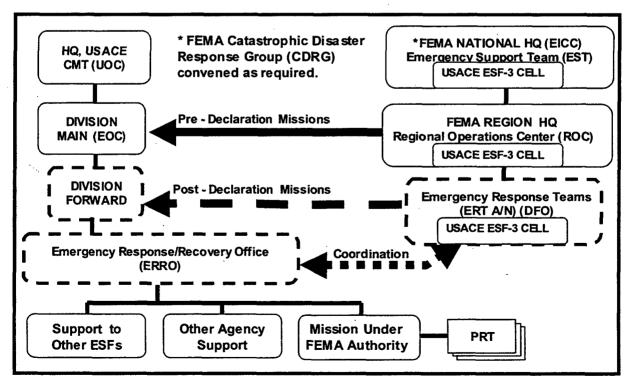


FIGURE 2. FEMA/USACE ORGANIZATION FOR STAFFORD ACT RESPONSE 18

REGIONAL/LOCAL-LEVEL ORGANIZATION

USACE has also embedded representatives in each element of FEMA's regional/local-level response structure. FEMA maintains a full-time office in each of its ten regions. When a disaster occurs, FEMA's Director in the affected area activates a Regional Operations Center (ROC), usually located at its Regional Office, to coordinate Federal response efforts until a Disaster Field Office (DFO) with Emergency Response Team (ERT) is established in the field. ¹⁹ USACE provides ESF #3 representatives to work at the Regional Operations Center in the Infrastructure Support Branch of its Operations Section.

FEMA's objective is to provide expert assistance to any Presidentially declared disaster site in the United States and its possessions as soon as possible. To facilitate rapid response, the regional FEMA office forms an Emergency Response Team – Advance Element (ERT-A). The USACE Division that receives the mission provides an ESF #3 Management Team as its

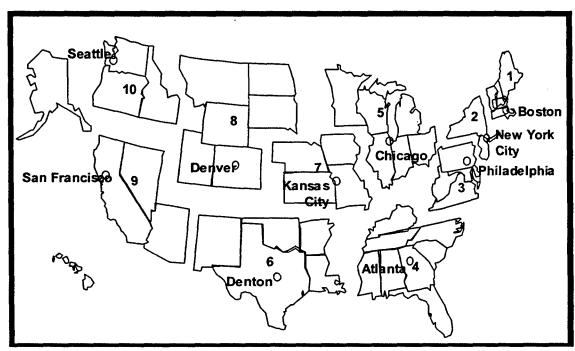


FIGURE 3. FEMA REGIONS²⁰

representative to the Emergency Response Team – Advance Element. The size of the ESF #3 Management Team varies by disaster type and extent. If the Division lacks needed expertise, the HQ USACE Operations Center can augment from a team roster of experienced and qualified personnel.²¹ When a catastrophe demands the full capabilities of FEMA, it may order an Emergency Response Team – National (ERT-N) to the affected area to augment the Emergency Response Team – Advance Element. Headquarters USACE has established three two-person Emergency Response Teams – National to represent the ESF #3 function when

FEMA directs formation of an ERT-N. USACE Emergency Response Team – National members have extensive disaster relief experience, nationwide contacts and strategic-level training. Each team is rostered and subject to activation by the USACE Operations Center on a rotating basis every third month.²²

Once a Disaster Field Office is established in the vicinity of an affected area, the Emergency Response Team – Advance Element expands in size and scope and becomes the Emergency Response Team. The Emergency Response Team resides in the DFO and is the principal Federal interagency group to provide direct relief. FEMA's Emergency Response Team consists of the Federal Coordinating Officer's (FCO) support staff and four main sections; Operations, Information and Planning, Logistics and Administration. USACE ESF #3 representatives are an integral part of the Emergency Response Team, locating in the Infrastructure Support Branch of its Operations Section. As outlined in the Federal Response Plan,

Among the ESF #3 roles are preparing statements of work, cost estimates, and estimated completion dates for mission assignments; maintaining cognizance of all other Emergency Response Team activities; assessing information; determining resource requirements; setting priorities; disseminating information; and taking other response and recovery actions as required. In addition to assigning the representatives from the Emergency Response Team – Advance Element to the full Emergency Response Team, the designated USACE division will also provide necessary staff for both response and recovery operations.²⁴

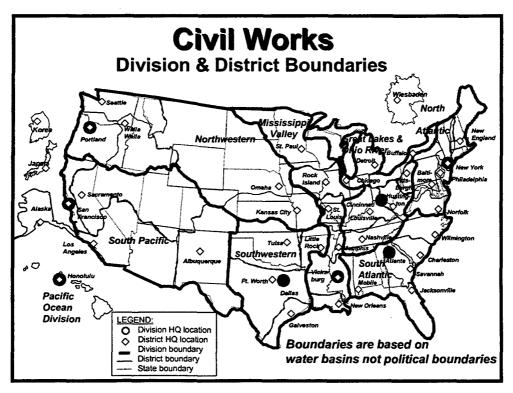


FIGURE 4. USACE DIVISIONS & DISTRICTS²⁵

USACE Emergency Response Team representatives coordinate ESF #3 missions with FEMA and other agencies at FEMA's Regional Operations Center and Disaster Field Office. Division and district EOCs initially command and control ESF #3 mission execution. However, when a disaster involves extensive destruction that generates significant ESF #3 missions of long duration, the Corps will establish a separate control center to execute them. USACE discovered the value of a dedicated ESF #3 command and control center when it responded to the Midwestern Floods of 1993. It was the most devastating flood sequence in American history and affected nine states in the Upper Mississippi and Lower Missouri River basins over a period of several months. Division and district EOCs in the disaster area were quickly overwhelmed by coordination and mission tracking requirements. In order to provide overarching command and control of all ESF #3 efforts, USACE activated the office of the Deputy Director of Civil Works -Forward and placed the Commander of the Ohio River Division in charge. The office, "provided a regional setting to ensure Headquarters USACE policies were reviewed, interpreted, and applied uniformly. The office also became a one-stop shopping center from which to coordinate all public affairs and to provide liaison with congressional, state, and local interests."26 USACE noted the "forward office's" success as one of its significant lessons learned from the 1993 flood response. Since that time, the concept has been developed further and codified to apply to division-level operations.

The control center that has evolved from 1993's Deputy Director of Civil Works – Forward is called the Emergency Response and Recovery Office (ERRO). It is staffed completely by USACE ESF #3 functionaries. Establishment and organization of an Emergency Response and Recovery Office is the responsibility of the impacted division under the direction of a leader who is designated the Division Forward/ Emergency Response and Recovery Office Commander. Usually a subordinate district establishes the Emergency Response and Recovery Office and provides its essential management structure to ensure continuity of operations within the impacted area. The Emergency Response and Recovery Office is staffed to meet the requirements of the disaster and generally mirrors the District's organization. USACE-wide assets are available from the USACE Operations Center on request to augment the responsible division/district. The Emergency Response and Recovery Office focuses solely on FEMA-directed disaster relief missions and ensures they are successfully executed.²⁷

USACE intends to create flexibility throughout its national and regional/local organizations for emergency response. Although every USACE office maintains capabilities to perform a variety of ESF #3 tasks, each disaster situation is different and may require resources that reside outside the division that serves the affected area. Therefore, USACE has

institutionalized flexibility into the Emergency Response Team structure that facilitates providing help to a locale from anywhere in its national organization, including its laboratories. Under the national concept, Headquarters USACE has directed each Corps district to establish a mission Planning and Response Team (PRT), "dedicated to one of the eight emergency response tasks for which the Corps is responsible: ice, water, emergency power, debris removal, temporary housing, emergency access, temporary roofing, and structural safety assessment." Since each of USACE's 38 CONUS districts is required to form a Planning and Response Team for at least 1 of the 8 emergency response tasks, the Corps has created internal redundancy that allows it to tailor its response to any specific emergency.

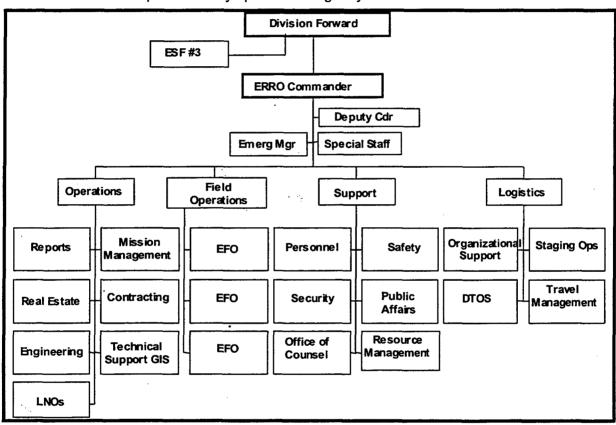


FIGURE 5. TYPICAL ERRO ORGANIZATION²⁹

Although Planning and Response Teams are established at district commands, they become assets of the USACE Operations Center for mission execution. The predesignation and immediate availability of Planning and Response Teams have reduced the Corp's response time to disasters. In the initial after action review of the response to the 11 September 2001 terrorist attacks, Planning and Response Teams were praised for deploying rapidly, becoming operational quickly and executing flexibly.³⁰ USACE Planning and Response Teams accept

their emergency assignment as an additional duty. Since these personnel are key members of their home districts, the USACE Operations Center rotates them within 30 days of deployment.

An example of the organizational flexibility that USACE has created for disaster relief is currently in full swing. At the peak of response and recovery efforts in New York City after the terrorist attacks, 164 USACE employees from every Corps division, each of its labs and the 249th Engineer Battalion (Prime Power) were at the disaster scene.³¹ Although North Atlantic Division (based in New York City) is in charge of the ESF #3 function at the World Trade Center, other divisions are providing specialized expertise. A South Atlantic Division member is on site as the Corp's expert in debris management and Northwestern Division personnel are providing Global Information System mapping support at Ground Zero. There are also examples of organizational flexibility within the responsible division. In the New York case, the ESF #3 Team Leader and several members of the team came from Norfolk District. New England District provided an 11-man response team that arrived on 12 September to offer immediate assistance until New York District was in a position to take over.³² Baltimore District handles many of the contracting responsibilities and New England District performs accounting functions for the New York recovery efforts. Indications are that these disparate USACE elements complemented each other and worked together effectively in an extremely tense and chaotic situation.

PLANNING, TRAINING AND PREPARATION FOR THE ESF #3 MISSION

Most professionals would agree that a well tailored organization is essential to carry out a complex mission such as the ESF #3 in time-sensitive and emotion packed situations such as those encountered during Federally declared disasters. Most would also agree that a well tailored organization will be ineffective unless the leaders and staffs of emergency responders also plan and train specifically to prepare for anticipated disasters. In the case of ESF #3, it is apparent that FEMA and USACE have planned, trained and prepared extensively to respond to a variety of potential disaster situations. In particular, USACE has, "over the past three years, embarked on a catastrophic disaster response planning and continuous improvement process involving response evaluations, critiques, strategic planning sessions, interagency planning, and training and exercising." In these areas, USACE has made effective use of its military expertise to prepare detailed plans and conduct training in disaster response. USACE has been proactive in planning, developing a disciplined training program, procuring necessary equipment and conducting detailed after action reviews to ensure continuous improvement.

PLANNING

USACE has created emergency response plans at each level of its organization. At the national level, USACE Headquarters has produced several plans and guides on how to respond to different types of potential disasters. Subordinate divisions and districts have concentrated their planning efforts on the types of disasters most likely to occur in their specific geographic regions.

Readiness 2000

The plans USACE creates at the national level ensure that the Corps organizes and manages its resources so it can respond anywhere in the nation with the proper support package, tailored to the specific needs of the given locale and situation. To that end, USACE developed a national strategy called the "Readiness 2000" (R2K) concept. A key part of Readiness 2000 Readiness 2000 is the creation of USACE Planning and Response Teams (PRT) that were discussed in the preceding section.

The primary USACE planning document under Readiness 2000 for ESF #3 response at all levels of the organization is the ESF #3 Field Guide. The guide was first published in 1999 and is updated several times a year. The most recent edition was published in July 2001 and updated in September. It contains the ESF #3 Concept of Operations, describes the USACE organization for ESF #3 at all levels and provides checklists, fact sheets, policy memos and points of contact for the mission. The guide also states that, because the disaster response and recovery process is complex and dynamic, there can be no SOP. Still, the ESF #3 Field Guide is comprehensive and extremely detailed, with enough inherent flexibility to apply to virtually any disaster situation.

At the next level, each division/district is responsible for conducting joint planning with state and local governments, as well as with other federal agencies in their regions. Although the format for these plans is not dictated by Headquarters USACE, many of them would be familiar to military personnel. South Atlantic Division, for example, issues OPORDs and FRAGOs for hurricane response. It has even created a response matrix (essentially a synchronization matrix) that shows actions to take and the time they should be initiated. Much of the planning is conducted jointly during FEMA's Regional Interagency Steering Committee meetings. FEMA's national headquarters encourages its regional offices to be proactive in performing this planning and USACE divisions/districts have proven to be eager partners.

After Action Reviews

FEMA and USACE have institutionalized a system of post-disaster after action reviews (AARs) to capture lessons learned and continually improve. They jointly developed a Remedial Action Program, "which has an established cycle of after action reviews, evaluations of issues, strategic planning discussions, and disaster preparedness exercises. Priority interagency items will be considered for inclusion in the Remedial Action Plan (RAP), which focuses on FEMA and USACE corrective action efforts." This paper treats AARs, which are assessments, as an extension of planning.

USACE has developed an impressive body of post-disaster AARs and has created an internal automated system through which the lessons can be shared throughout the organization. To organize its AAR process, the Corps adopted a standard established by the National Fire Protection Association (NFPA) for disaster/emergency management continuity programs. Called the NFPA 1600 Program, it categorizes issues to, "help organize current (and future) policies, plans and procedures into a logical framework and across organizational boundaries." After a disaster, USACE issues an AAR that summarizes, "the disaster operations and interagency cooperation, including: a discussion of the emergency situation, types of assistance provided and the cost, coordination with FEMA and other agencies, effectiveness of the response, strengths and weaknesses of the operation and specific problems and solutions."

TRAINING

In recent years, USACE has put major effort into creating training programs that will prepare its personnel to be effective in each aspect of the ESF #3 mission. The USACE training concept for ESF #3 has established, in accordance with Readiness 2000, a foundation of USACE-wide courses and exercises, augmented with focused training conducted by divisions and districts in conjunction with state and local authorities. Joint training has been beneficial even though training scenarios can't predict actual emergencies. After action notes from the Midwest floods of 1993 stated, "USACE personnel had previously participated in joint disaster relief exercises with FEMA personnel and local authorities. Although these exercises revolved around various scenarios including earthquake, nuclear power plant evacuation, and civil disturbance responses, they helped establish lines of coordination between military response forces and civilian agencies." It is standard procedure for USACE divisions/districts and other agencies to conduct training based on anticipated hazards in the region. An example of this is Baltimore District's participation in Maryland's Hurricane Exercise 2000, based on the most

likely natural disaster scenario for this East Coast state. The District trained Maryland Emergency Management Agency personnel on USACE's role during a Stafford Act disaster and reviewed existing contracts to support the effort. However, the most important aspect of the training was not the accuracy of the scenario but the exposure of USACE to coordinating with and working along side other federal, state and local agencies.

Joint training between FEMA and USACE has been particularly successful. Pat Kuzmiak, at South Pacific Division's Readiness Support Center, stated a popular opinion among USACE emergency responders regarding their training relationship with FEMA:

USACE has been very proactive in its partnering initiatives with FEMA; as a result of their joint approach to preparedness, USACE and FEMA have greatly improved effectiveness in timely, corporate execution of the ESF #3 mission over the last several years. The development and preparation of several specialized USACE-wide teams and cadres – through a program of training, exercises, and seminar workshops that include FEMA participation – represents an outstanding achievement in preparedness and execution of the ESF #3 mission.⁴¹

One of the joint FEMA/USACE training efforts is a mutual agreement to hold an annual Senior Leaders' Seminar. The first one was held in 1999. During these seminars, senior leaders from USACE, its divisions, FEMA, its regions and now state and local governments discuss issues generated using various disaster exercise scenarios. Actionable problems are noted in an after action report and are prioritized for attention according to the FEMA/USACE Remedial Action Plan. FEMA has encouraged each of its primary ESF agencies to adopt similar senior leader training programs for their emergency support functions. In addition, USACE hopes to expand the program to reach its personnel at lower levels.

Another joint training program has been developed by FEMA. Called the "Emergency Education Network", it provides emergency management training sessions for the interagency nationwide. USACE partners with FEMA to provide some of the instruction, as well as many of the students. For example, in October and November of 2001, FEMA and USACE jointly sponsored education sessions on "Floodplain Mapping" and "Design and Guidance for Community Shelters". The willingness of FEMA and USACE to dedicate precious resources to train in emergency management has had a huge impact on the speed and efficiency with which both organizations respond to disasters.

PREPARATION

Over the past decade, USACE significantly improved its mobile operational capability to support disaster relief operations. Well trained early responders must have rapidly deployable, highly capable operations centers and ancillary equipment in order to be relevant immediately

upon arriving at a disaster scene. Charlie Kemp, a member of Mobile District and veteran of hurricanes Mitch, Fran, Bertha and Opal described the Corps' mobile operations centers of the 1980s and early 1990s in this way, "We had three business-type trailers...They did the job, but they were really slow. We'd have breakdowns or blow-outs every 200 miles. They had to be towed to the site, and they didn't even have a bathroom. Previously, each district was doing its own thing and none of it really worked together." During the mid-1990s, USACE made significant strides to standardize both its disaster relief organization and the equipment available to support it. USACE has developed and procured several highly capable mobile operations centers that can be deployed rapidly to a disaster site. They contain the requisite communications, automation, work space and life support to make the ESF #3 function operational within hours.

Deployable Tactical Operations Systems

USACE has created Deployable Tactical Operations Systems (DTOS) that are distributed nationwide to allow rapid establishment of disaster relief operations in locations with heavily damaged infrastructure. Central to the Deployable Tactical Operations System is the procurement in 1999 and 2000 of 6 Rapid Response Vehicles (RRV). These vehicles are built on an International Harvester chassis. They accommodate 7 or more personnel and are outfitted with laptop computers, GPS, digital cameras, cellular phones, intercoms, satellite communications, drafting and mapping software, a 15KW generator and the wireless capability to network laptops within 200 feet of the vehicle. They can cruise at 70 miles per hour. With one of these vehicles, USACE can provide Emergency Response Team – Advanced Element representatives to any disaster site in CONUS within 18 hours and have them operational in 45 minutes. A Rapid Response Vehicle is stationed at a USACE district headquarters within 6 of its 7 CONUS divisions (one each in Baltimore, Los Angeles, Portland, Fort Worth, Saint Louis and Nashville Districts). 46

The other elements of USACE's Deployable Tactical Operations Systems include three pairs of 37-foot mobile office trailers pulled by Freightliners (one pair in Sacramento and two in Mobile). Each of these pairs is supported by an Emergency Communications Vehicle and an Emergency Support Vehicle with tools, office supplies and ancillary support equipment. In response to the terrorist attacks on the World Trade Center, USACE mobilized and deployed two of its Deployable Tactical Operations Systems with personnel, "which became the forward command posts for the New York Fire Department around Ground Zero. The Deployable

Tactical Operations Systems also replaced the city's emergency operations center, destroyed in the World Trade Center."⁴⁷

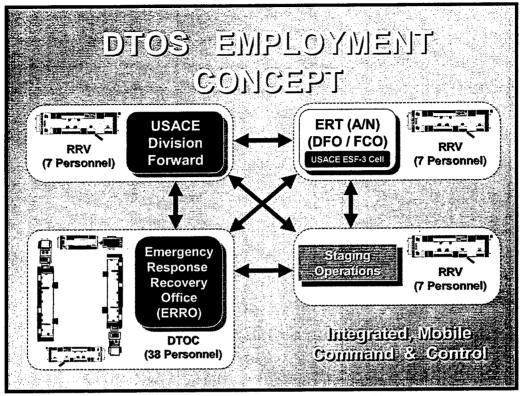


FIGURE 6. TYPICAL DTOS LAYOUT48

USACE has also created three Fly-Away Kits. These kits consist of the same equipment described above but they are containerized and ready to transport to OCONUS states and possessions. The Fly-Away Kits are located in Honolulu, Jacksonville and Japan Districts. ⁴⁹ By stationing this deployable equipment in key locations around the U.S. and overseas, USACE seeks to ensure timely access to any potential disaster area with ESF #3 mission-tailored support.

Advanced Contracting Initiative

USACE's preparation for rapid response extends beyond the procurement and packaging of support equipment. The Corps has developed what it calls the "Advanced Contracting Initiative" (ACI), a method of pre-positioning contracts with private firms for services that will likely be required in an emergency to support the ESF #3 function. The South Atlantic Division experimented with the concept in 1997 and 1998. USACE then assigned it Corps-wide responsibility for issuing the initial solicitations for the Advanced Contracting Initiative in 1999. The Division's website describes the Advanced Contracting Initiative in the following passage:

USACE studied emergency/disaster responses for the last decade and determined that, beginning in 1999, we would use full and open competition and best value source selection procedures for these requirements. The resultant contract awards would be Corps-wide requirements contracts for ice and water and multiple requirements contracts with indefinite delivery – indefinite quantity options for temporary power, temporary roofing and debris management. All contracts would be for a base one-year ordering period with options for two additional one-year ordering periods...Once awarded, these contractors would be issued Delivery or Task Orders for emergency/disaster response requirements in the geographic locations covered by each contract. ⁵⁰

The Advanced Contracting Initiative's intent, to set the conditions for rapid ESF #3 response in an emergency at a predictable cost, appears to have been met. During recent floods in Ohio, Huntington District mobilized its Indefinite Delivery Contractor for debris removal. The initial USACE work estimate was for \$600,000 and 30 days to clean up 14 sites. Even though 6 additional sites were eventually added to the work requirement, the contractor mobilized in 2 days and completed all work a week ahead of schedule and \$200,000 under budget. The mission was so successful that FEMA now uses it as an example for training its response and recovery directors. Arthur Shaw, the public works operations engineer for Virginia Beach, VA agrees that pre-positioned contracts work well to control costs during emergencies. In the aftermath of 1999's Hurricane Hugo, USACE used Advanced Contracting Initiatives extensively to clear flood debris in the devastated town of Franklin, VA. The debris was removed ahead of schedule and under budget, prompting Shaw to observe that with pre-positioned contracts, "the benefits far outweigh any negatives. These contracts are written in a unit pricing manner. The locality pays by the hour, or by the truckload, only for the services it says it needs. This way, you won't be gouged by profiteers."

The Advanced Contracting Initiative has proven so successful that USACE has made it a standing operating procedure for emergency response preparation. Responsibilities for developing the specifications and issuing solicitations to perform the functions nationwide are now distributed among five USACE divisions.

ENGLink

It is evident that USACE has gone to great lengths to create an organization trained in the appropriate doctrine and properly equipped to execute ESF #3 missions. In order to maximize the Corps' potential to rapidly respond to crises and adapt quickly in an environment of continual change, USACE has developed a web-based system to facilitate many of the planning, communications and command and control tasks inherent in disaster response. Called Engineer Link or ENGLink, the system is a secure, USACE-wide interactive website.

ENGLink provides a real-time vehicle for assigning and tracking ESF #3 missions, providing situation reports, spot reports, operational summaries and recording after action comments for any disaster response nationwide. When the local communications infrastructure is severely damaged or austere, satellite connections are possible. This system facilitates information exchange across all USACE divisions and districts. Even though the ENGLink system is relatively new and not yet optimized, use of the system as a source of taskings, information exchange and command and control during response to the 11 September terrorist attacks was generally successful. USACE is scheduling a separate World Trade Center/Pentagon AAR that will address ENGLink specifically, with a goal of making it even more useful.

AREAS FOR IMPROVEMENT

INTERAGENCY PREPARATION

Funding available to the interagency for disaster relief training tends to be limited. Interest in preparing for disaster relief missions also varies widely among the agencies involved. As a result, many government agencies fail over time to improve their response to emergencies. Funding scarcity is not an overwhelming obstacle for USACE because its civil works projects generate an acceptable level of operating and training money. However, funding shortfalls and lack of interest by other government agencies directly impact USACE in two ways. First, attendance by others at USACE-sponsored disaster relief training events and after action reviews is inconsistent. For example, in March 1997, USACE was directed to be the lead Federal agency of an interagency task force (ITF) on flood control and prevention in Northern California. USACE did not have the authority to compel interagency participation but it was responsible for the interagency task force's product. USACE's final AAR noted:

Though the agencies endorsed the interagency task force process as outlined in the formal charter, most agencies struggled with their respective workloads and support requirements for the ITF process. Since agencies were not directly funded for this activity, most provided what level of effort they could while trying to balance their own workloads. Thus, commitment to the process was not as good as it could have been. Actual participation varied from 40 percent to 80 percent at times.⁵⁵

Mike Beaird, a USACE ESF #3 Team Leader who was among the first to be sent to respond on 11 September, has had similar experience when performing disaster relief training. He notes, "While USACE trains to respond to FEMA, only a small amount of people from other

Federal agencies attend USACE or FEMA training. That's largely because ...training funds are not abundant."⁵⁶

The experiences described above are by no means isolated and they lead to the second impact on USACE. During disaster events, FEMA tends to turn to USACE as a backstop for other agencies who are unprepared. USACE was blunt about this in its AAR for the 11 September terrorist attacks, noting, "USACE has become a safety net for FEMA regarding all other federal agencies who do not do their missions. This needs to be addressed by FEMA." In consequence management situations, the Corps' emergency responders do what is necessary to accomplish the mission, save lives and minimize property damage. However, there is clearly a need for other federal agencies to dedicate more resources and effort between disasters to train and prepare so that they can pull their share of the load during the next crisis.

NATIONAL - REGIONAL COMMAND AND CONTROL

Despite USACE's continuing efforts to standardize organizations and procedures regarding the ESF #3 mission, it still has seams in its command and control structure. The problems are not large enough to cause mission failure but they are significant enough for USACE to address. As you can see from Figure 2, there are several layers of command between the responder and national headquarters. Both FEMA and USACE track the same information regarding ESF #3, but through two command structures -- the FEMA stovepipe and the USACE stovepipe. USACE has organized to solve the inherent problems of a parallel information chain by embedding ESF #3 cells at each level of the FEMA chain. However, the process of information exchange across the stovepipes is problematic during the early stages of disaster response. While responding to the 11 September terrorist attacks, reports did not flow from the USACE Operations Center to FEMA's Emergency Support Team for the first few days. Teleconferences designed to inform ESF #3 cells in the Emergency Support Team, Regional Operations Center and at the Disaster Field Office did not work early on. This created unnecessary confusion regarding the status of FEMA mission assignments, which were generated initially by the Emergency Support Team.⁵⁸ This created anxiety in FEMA's chain of command even though missions were actually being accomplished quite well on the ground.

Another case in point was evident in New York City during the response to the terrorist attacks. While USACE was able to alert, mobilize and deploy Planning and Response Teams quickly from across the country, command and control of them broke down at the disaster site. North Atlantic Division did not know who many of the Planning and Response Teams were or where they were located. Although Philadelphia District had established a central receiving

area, most of the Planning and Response Teams were unaware of this and failed to report in. Even though Planning and Response Team deployments were noted on ENGLink, the system was generally not accessible at the disaster scene until Day 3.⁵⁹ As a result, some Planning and Response Teams operated on their own for a few days and some Planning and Response Team mission assignments were duplicated out of ignorance.

Related to this finding in New York City, FEMA and USACE came to a similar conclusion after their Senior Leader Seminar 2000. During that event, which was driven by a New Madrid earthquake scenario, FEMA regions and USACE divisions and districts separated by thousands of miles were required to share resources for a disaster that was uncommon in their own areas of responsibility. "Participants expressed concern over FEMA Regional Offices and USACE Divisions that do not routinely interact not being prepared to act as an effective back-up should multiple disasters occur simultaneously." Although USACE has sufficient expertise in its nation-wide organization to perform its ESF #3 functions effectively in multiple disaster situations, command and control of the assets could be a problem when divisions and districts have not trained to back each other up in unfamiliar scenarios.

Although USACE's and FEMA's existing command and control structures are solid, their organizational complexity is such that hiccups in coordination at any level are magnified as they go up the chain. The resulting confusion can blur disaster response operations at the time they are the most tenuous – during the early hours and days of the response. Additionally, a huge disaster that spans several regions or multiple simultaneous disasters will severely tax USACE personnel and equipment capabilities, as well as the Corps' ability to command and control them.

COMMUNICATIONS

Communications, which is directly related to command and control, needs to be strengthened for disaster response. By definition, a disaster site may experience severe damage to its existing communications structure. Standard systems, such as landlines and cell phones are often inoperative or quickly overwhelmed. Therefore, emergency responders and their headquarters require robust and portable communications systems. USACE has most of these pieces within its national organization but their distribution is not optimized. For example, most districts possess communications fly-away kits and satellite links but the divisions do not. This creates an immediate command and control issue because Headquarters USACE often has the ability to contact some deployed Planning and Response Teams via satellite while the division EOCs that are tracking ESF #3 missions cannot.

Intranet-based communications systems have also exhibited some inherent problems. Currently, FEMA and USACE intranets are not interoperable. FEMA's National Emergency Management Information System (NEMIS) terminals cannot access the USACE secure ENGLink system and vice versa. Computer security requirements hamper information sharing between networks and headquarters, yet when security is breached, entire systems are at risk. In New York, an attack by the Nimda virus during the recovery severely disrupted FEMA and, to a lesser extent, USACE networks. E-mail was down for a significant period. Technical solutions are currently unproven, expensive and of low priority. Additionally, the advantages an intranet provides in speed and volume of information flow are lost at the disaster site if responders have to rely on dial-up connections and modem speeds.

Reliance on high technology systems for effective communications requires robust (and expensive) Information Technology organizations and equipment. As a result of recent experience, USACE has identified some areas in this field that need improvement. In its Senior Leaders' Seminar 2000 AAR, USACE recommended that the NEMIS and ENGLink systems be linked so they can, "operate on the same level and utilize the same information". ⁶³ In addition, USACE noted that streamlining ENGLink, NEMIS and DoT databases would help provide a common picture for interagency responders by reflecting the same information for senior decision-makers. ⁶⁴

CONCLUSION

The performance of FEMA and USACE since 1993 while executing Emergency Support Function #3 is a great success story. It is also clearly not a coincidence. The successes that FEMA and USACE have realized in ESF #3 are products of detailed planning from national to local level, effective organizational design, extensive training and determined preparation.

Although USACE itself has concluded it has room for improvement, its current ESF #3 capabilities and performance are exceptional. Testimonials to USACE's success are highly placed and definitive. In its 2001 annual rating of government agency performance, the Office of Management and Budget (OMB) rated USACE's disaster response performance as "Excellent". This is the OMB's highest rating and is almost impossible to achieve. A similar opinion was expressed by FEMA's Federal Coordinating Officer in New York City, Ted Monette. When asked what he would change regarding USACE's relationship with FEMA or its performance of the ESF #3 mission, Monette responded, "Not a thing – and I'd say that on the record or off the record."

This paper documents the reasons for USACE's excellent performance in Emergency Support Function #3. It starts at the national level, where USACE created doctrine called the Readiness 2000 Concept. The Concept provided for the development of a wide range of ESF #3 capabilities and procurement of specialized equipment. Readiness 2000 institutionalized the development of Corps response elements that parallel each of FEMA's, from the national to regional to state/local level. It led to the procurement of Deployable Tactical Operations Centers that are strategically sited across the country for rapid response. It supported development of the ENGLink intranet system and contracting innovations such as the Advanced Contracting Initiative, both of which speed delivery of disaster response and recovery efforts. It created planning and training programs that spread knowledge of the capabilities and a system that facilitates sharing them across all USACE division and district boundaries. Divisions and districts have embraced the Readiness 2000 concept and incorporated aspects of region-specific needs into their organizations, training programs and preparation for disaster response.

Of course, USACE's execution of Emergency Support Function #3 cannot be characterized as flawless. This paper identifies shortcomings in USACE's command and control structure and its communications systems that complicate ESF #3 execution. It also demonstrates that the lack of preparedness of some federal, state and local agencies has caused FEMA to depend on USACE to backstop their failures. Despite these difficulties, there are two reasons for optimism. First, the identified problems are not critical to the performance of ESF #3. Instead, they merely complicate USACE's attempts to eliminate obstacles to disaster response. The second reason for optimism is that USACE has already noted its shortcomings through exhaustive AARs and prioritized them for correction in coordination with FEMA under the Remedial Action Program. USACE's proactive approach to ESF #3 during the last nine years has closed the gap considerably between ideal and actual disaster response.

Any government agency that wishes to improve its disaster preparedness would do well to follow USACE's example. Even though the efforts of the Corps of Engineers are directed against only one of the twelve Emergency Support Functions, USACE's comprehensive approach can be applied by any organization to any of them. USACE has proved that a dedicated, integrated, interagency effort that addresses doctrine, organizing, planning, training and preparing for disaster relief can be successful – if it's followed through.

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ENDNOTES

¹Congress requested this report after failed Federal efforts to respond effectively to the Loma Prieta Earthquake and Hurricane Hugo in 1989 and Hurricanes Andrew and Iniki in 1992. The report was very critical of FEMA and the agency generally agreed with its findings. General Accounting Office, <u>Disaster Management: Improving the Nation's Response to Catastrophic Disasters</u> (Washington, D.C.: U.S. General Accounting Office, July 1993).

²Congress requested this report to determine FEMA's progress in responding to terrorist attacks after the Oklahoma City bombing. The GAO noted significant progress across the board. General Accounting Office, <u>Combating Terrorism: FEMA Continues to Make Progress in Coordinating Preparedness and Response</u> (Washington, D.C.: U.S. General Accounting Office, March 2001).

³Although "Essayons (Let us Try)" is the official motto of the Corps of Engineers, the Seabees' motto quoted in the article ("The difficult, we do immediately. The impossible takes a little longer") is often applied to USACE as an unofficial motto. In this case, Governor Ridge applied it to USACE. Dana Milbank and Bradley Graham, "With Crisis, More Fluid Style at White House; Faster Decision-Making Has Flip Side: Confusion," <u>The Washington Post</u> (10 October 2001): A.4 [database on-line]; available from UMI ProQuest, Bell & Howell; accessed 17 December 2001.

⁴The GAO report summarizes the purpose of the Stafford Act. General Accounting Office, <u>Combating Terrorism: FEMA Continues to Make Progress in Coordinating Preparedness and Response</u>, 6.

⁵Renea Coston, "Emergency Preparedness and Disaster Relief," 28 March 2001; available from http://www.hqda.army.mil/asacw/relief.htm; Internet; accessed 19 December 2001.

⁶Army Corps of Engineers, ESF #3 Field Guide, Section 1-4.

⁷Department of Defense, <u>Military Support to Civil Authorities</u>, Department of Defense Directive 3025.1 (Washington, D.C.: U.S. Department of Defense, 15 January 1993), 3.

⁸Department of Defense, <u>Manual for Civil Emergencies</u>, Department of Defense Manual 3025.1-M (Washington, D.C.: U.S. Department of Defense, June 1994), 126.

⁹Federal Emergency Management Agency, <u>Federal Response Plan</u>, 9230.1-PL, (Washington, D.C.: Federal Emergency Management Agency, April 1999), ESF#3-1, 2.

¹⁰Although DOMS is designated as DoD's orders-issuing headquarters for all military support to civil authorities, this does not apply to USACE because it executes the ESF #3 mission directly for FEMA under the <u>Federal Response Plan</u>. Department of Defense, <u>Military Support to Civil Authorities</u>, 10.

¹¹The intent of "immediate response" is to allow military commanders to use common sense if it is obvious their actions can mitigate suffering from a disaster if they act right away, even without approval. Ibid., 6.

¹²Department of Defense, <u>Manual for Civil Emergencies</u>, 2.

- ¹³Army Corps of Engineers, "Information Paper: Responding to Emergencies: The Role of the U.S. Army Corps of Engineers in Support of the Nation"; available from http://www.usace.army.mil; Internet; accessed 19 December 2001.
- ¹⁴Army Corps of Engineers, "U.S. Army Corps of Engineers and the Federal Response System"; available from http://www.hq.usace.army.mil/cepa/pubs/brochure/one.htm; Internet; accessed 31 December 2001, 3.
 - ¹⁵Federal Emergency Management Agency, <u>Federal Response Plan</u>, 22.
 - ¹⁶lbid., 22.
 - ¹⁷lbid., ESF #3-5,6.
 - ¹⁸Army Corps of Engineers, ESF #3 Field Guide, Section 1-8.
 - ¹⁹Federal Emergency Management Agency, Federal Response Plan, 17.
 - ²⁰Army Corps of Engineers, ESF #3 Field Guide, Appendix E-2.
- ²¹The USACE Operations Center maintains a list of all eligible disaster response teams nationwide. Some are on alert, others are on call and still others are designated as backups. Potential teams are generally rotated in and out of a deployable status either monthly or quarterly. Ibid., Section 2-2.
 - ²²Ibid., Section 1-23.
 - ²³Federal Emergency Management Agency, <u>Federal Response Plan</u>, 19.
 - ²⁴lbid., ESF #3-4.
- ²⁵Robert T. Slusar, "U.S. Army Corps of Engineers," briefing slides, Carlisle Barracks, U.S. Army War College, 2001.
- ²⁶Arthur E. Williams, "The Corps Response to the Great Flood of 1993," <u>Engineer</u>, April 1994, 5.
 - ²⁷Army Corps of Engineers, <u>ESF #3 Field Guide</u>, Section 6-2.
 - ²⁸lbid.
 - ²⁹Ibid., Section 6-3.
- ³⁰Army Corps of Engineers, "USACE First Impressions Report: September 11, 2001 World Trade Center and Pentagon Terrorist Attacks," 7 November 2001, 9.
 - ³¹Bernard Tate, "Corps Responds," <u>The Army Engineer</u>, November/December 2001, 10.

- ³²Vince Elias, Sue Hopkins, Wayne Stroupe, Justine Barati and Bernard Tate, "Corps Action in New York City," <u>Engineer Update</u> November 2001; available from http://www.hq.usace.army.mil/cepa/pubs/nov01/story17.htm; Internet; accessed 31 December 2001.
- ³³Army Corps of Engineers, "USACE First Impressions Report September 11, 2001 World Trade Center and Pentagon Terrorist Attacks," 2.
- ³⁴The introduction to this document specifies that it cannot be treated as a Standard Operating Procedure but it provides detailed guidance applicable to most emergency situations. Army Corps of Engineers, <u>ESF #3 Field Guide</u>, Section 1-2.
- ³⁵The Army Corps of Engineers often uses five-paragraph orders and other military planning tools to promulgate its planning efforts. Michael Beaird <u>Michael.I.beaird@lrl02.usace.army.mil</u>, "RE: Request for Info," electronic mail message to Jeffrey Smith <u>Jeffrey.smith@carlisle.army.mil</u>, 2 January 2002.
- ³⁶Army Corps of Engineers, "USACE First Impressions Report September 11, 2001 World Trade Center and Pentagon Terrorist Attacks," 1.
 - ³⁷lbid, A-1.
- ³⁸Federal Emergency Management Agency, "Assistance Information;" available from http://www.usfa.fema.gov/fedguide/ch2-5.htm; Internet; accessed 19 December 2001.
- ³⁹Vern Lowery, "Lessons Learned: Midwest Flood of 1993," <u>Engineer</u>, February 1994, 26-27.
- ⁴⁰Maryland Emergency Management Agency, "State of Maryland Hurricane Exercise Hurrex 2000," <u>The Coordinator</u> August, September, October 2000; available from http://www.mema.state.md.us; Internet; accessed 31 December 2001, 5.
- ⁴¹Patricia Kuzmiak <u>Patricia.A.Kuzmiak@spd02.usace.army.mil</u>, "RE: Request for Info, electronic mail message to Jeffrey Smith <u>Jeffrey.smith@carlisle.army.mil</u>, 28 January 2002.
- ⁴²Southwestern Division, U.S. Army Corps of Engineers, "2001 Southwestern Division Regional Hurricane Readiness Workshop, 24-25 July 2001 Galveston, Texas: After Action Report;" available from http://www.marasconewton.com/emacc.htm; Internet; accessed 29 January 2002, 2.
- ⁴³Army Corps of Engineers, "After Action Report: Senior Leaders' Seminar 4-5 April 2000 Fort Belvoir, Virginia;" available from http://www.marasconewton.com/emacc.htm; Internet; accessed 29 January 2002, 13 & 15.
- ⁴⁴Federal Emergency Management Agency, "Emergency Education Network;" available from http://www.fema.gov/emi/2001sched_f.txt; Internet; accessed 31 December 2001.

⁴⁵Bernard Tate, "Vans Provide Mobile Emergency Center," <u>Engineer Update</u> March 1999; available from http://www.hq.usace.army.mil/cepa/pubs/mar99/story21.htm; Internet; accessed 31 December 2001.

⁴⁷Jerry Rogers, "Norfolk District Team Assists in New York City," <u>Engineer Update</u>
November 2001; available from http://www.hq.usace.army.mil/cepa/pubs/nov01/story18.htm; Internet; accessed 31 December 2001.

⁵⁰South Atlantic Division, Army Corps of Engineers, "Advance Contracting Initiative (ACI) for Emergency/Disaster Response Activities for Ice, Water, Temporary Power, Temporary Roofing and Debris Management;" available from http://www.sad.usace.army.mil/aci; Internet; accessed 31 December 2001.

⁵¹Steve Wright, "Huntington District Tackles Ohio Flood," <u>Engineer Update</u> August 1998; available from http://www.hq.usace.army.mil/cepa/pubs/sep98/story4.htm; Internet; accessed 19 December 2001.

⁵²Brian Parker, "Planning for Post-Hurricane Pickup," <u>The American City & County</u> (February 2000): 21 [database on-line]; available from UMI ProQuest, Bell & Howell; accessed 17 December 2001.

⁵⁴Army Corps of Engineers, "USACE First Impressions Report September 11, 2001 World Trade Center and Pentagon Terrorist Attacks," 13.

⁵⁵David E. Peixotto, "Interagency Task Force Final After Action Report for California Floods of 1997," 1 October 1997; available from http://www.spd.usace.army.mil/report.html; Internet; accessed 19 December 2001, 5.

⁵⁷Army Corps of Engineers, "USACE First Impressions Report: September 11, 2001 World Trade Center and Pentagon Terrorist Attacks," 15.

⁶⁰Army Corps of Engineers, "After Action Report: Senior Leaders' Seminar 4-5 April 2000 Fort Belvoir, Virginia,"11.

⁴⁶ Ibid.

⁴⁸Slusar, 2001.

⁴⁹Tate.

⁵³Army Corps of Engineers, <u>ESF #3 Field Guide</u>, Section 7-2,3.

⁵⁶Beaird, 2 January 2002.

⁵⁸lbid., 18.

⁵⁹Ibid., 10.

⁶¹In almost every category of mobile communications systems, USACE districts are better-equipped than their controlling division headquarters. Ibid., 16.

⁶²lbid., 17.

⁶³Army Corps of Engineers, "After Action Report: Senior Leaders' Seminar 4-5 April 2000 Fort Belvoir, Virginia," A-3.

⁶⁴lbid, 14.

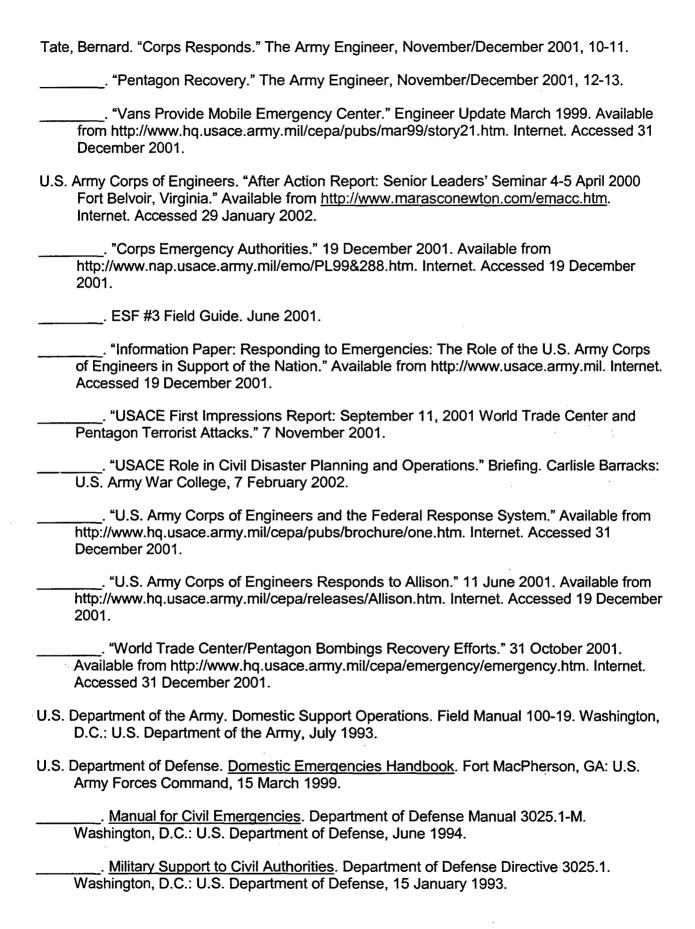
⁶⁵Army Corps of Engineers, "USACE Role in Civil Disaster Planning and Operations," briefing, Carlisle Barracks: U.S. Army War College, 7 February 2002.

⁶⁶Ted Monette, "FEMA Role in Consequence Management," briefing, Carlisle Barracks: U.S. Army War College, 1 February 2002.

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